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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
NGUYEN, BAO THUY L	
ART UNIT	**PAPER NUMBER**
1641	

DATE MAILED: 03/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

HL

Office Action Summary	Application No.	Applicant(s)	
	09/857,539	TSANG ET AL.	
	Examiner	Art Unit	
	Bao-Thuy L. Nguyen	1641	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 December 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5 and 17-20* is/are pending in the application.

4a) Of the above claim(s) *19* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,17,18 and 20* is/are rejected.

7)☒ Claim(s) *5* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 13 December 2004 has been entered.

Status of the Claims

2. Claims 6-16 are withdrawn. Claims 19-20 have been added. Claims 1-5 and 17-20 are pending.

Election/Restrictions

3. Newly submitted claim 19 is directed to an invention that is independent or distinct from the invention originally claimed for the following reasons:

Claim 19 requires an antibody that specifically binds to a soluble sporozoites of C. *parvum*, i.e. it requires the sporozoites to be soluble (530/386); whereas claims 1-5, 17-18 and 20 are directed toward an antibody that is specific for a soluble antigen from C. *parvum*, i.e. it only requires that antigens to be soluble and not the entire sporozoite (530/388.6).

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claim 19 is withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Note: a change of invention (i.e. the election of claim 19) is not permissible in RCE applications.

Rejections Withdrawn

4. The rejection of claims 1-4, 17 and 18 as being anticipated by Farrington is withdrawn in light of Applicant's argument that the antibodies taught by Farrington is specific for C. *parvum* oocysts instead of the sporozoite of C. *parvum*.

5. The rejection of claims 1, 3, 4, 17 and 18 as being anticipated by Moss is withdrawn in light of Applicant's argument that the antibodies taught by Moss is specific for C. *parvum* oocysts instead of the sporozoite of C. *parvum*.

6. The rejection of claims 1-4 and 17-20 as being anticipated by Tilley et al. is withdrawn in light of Applicant's argument that each of the antibodies taught by Tilley also cross reacts with oocysts or merozoites antigens.

Claim Rejections - 35 USC § 102

7. Claims 1-4, 17-18, and 20 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Perryman et al (WO 98/07320) for reasons of record which is reiterated herein below.

Perryman discloses antibodies specific to C. *parvum* sporozoites. See pages 13, 14, 17 and 19.

8. Claims 1-4, 17-18 and 20 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Petersen et al., *Infection and Immunity.* 1992. Vol. 60, No. 12, pp. 5132-5138 for reasons of record which is reiterated herein below.

Petersen discloses monoclonal antibodies to a soluble C. parvum sporozoite glycoprotein. See pages 5133-5137.

9. Claims 1-4, 17-18 and 20 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Riggs et al (WO 97/36612) for reasons of record which is reiterated herein below.

Riggs discloses compositions comprising monoclonal antibodies to C. parvum sporozoite. See pages 4-6.

Response to Arguments

10. Applicant's arguments filed 13 December 2004 have been fully considered but they are not persuasive.

Applicant asserts that the term "specific for" applies to each element listed: soluble, C. *parvum* and sporozoite, and that the art accepted meaning for "specific" is provided by Paul. Specifically, Paul states that "the specificity of an antibody or antiserum is defined by its ability to discriminate between the antigen against which it was made and any other antigen one might test. Since the antigen for which the claimed antibody was made is a "soluble antigen of a C. parvum sporozoite", only an antibody that can discriminate on all of these basis has the specificity required by the claims.

This argument has been fully considered but is not persuasive. Paul teaches that the specificity of an antibody or antiserum is its ability to discriminate between the homologous antigen or immunogen and any other antigen one might test. Paul also discloses that the overall specificity of a heterogeneous antiserum is a composite of two different facets of specificity. Type 1 specificity is based on the relative affinities of the antibody for the homologous antigen and any cross-reactive ligands. If the affinity is much higher for the homologous ligand than for any cross-reactive ligand tested, then the antibody is said to be highly specific for the homologous ligand, i.e. it discriminates very well between this ligand and the others. The specificity can also be quantitated in terms of the ratio of affinities for the homologous ligand and a cross-reactive ligand. On the other hand, type 2 specificity leads to a second definition of specificity. In type 2 specificity, if all the antibodies in the mixture react with the immunogen, but only a small proportion react with any single cross-reactive antigen, then the antiserum would

be said to be relatively specific for the immunogen. Paul states that it does not matter whether the affinity of a subpopulation that reacts with a cross-reactive antigen is high or low. As long as that subpopulation is a small fraction of the antibodies, the mixture is specific. (See Paul, pages 440-443. Specifically, the last paragraph on page 442 through page 443.)

Given these definitions, claims drawn to a composition comprising an antibody specific for a soluble antigen of a C. parvum sporozoite, when given their broadest reasonable interpretation encompass any composition having at least a subpopulation of antibody that can bind to a soluble antigen from a C. parvum sporozoite and that this subpopulation is in the majority; or any composition having antibodies that have a higher affinity for the homologous ligand.

This interpretation does not exclude a composition comprising an antibody that has a cross reactivity with other antigens tested, i.e. antigens from oocysts or merozoites or insoluble antigens from oocysts, merozoites or sporozoites. So long as the antibody has a higher affinity for the homologous ligand (i.e. soluble antigen of C. *parvum* sporozoite) than for any cross-reactive ligand tested, i.e. it discriminates very well between this ligand the others. Or, so long as only a small proportion of the antibody composition react with any single cross-reactive antigen.

Applicant's argument that Perryman does not anticipate the instant invention because the antibodies of Perryman are not specific for a soluble antigen has been fully considered but is not deemed persuasive. Applicant argues that because the antibodies

disclose by Perryman bind to epitopes found within the surface glycoprotein and thus cannot be specific for a *soluble* antigen. Applicant also argues that Perryman does not teach or suggest that the glycoprotein is soluble.

The term "soluble" is defined in the specification at page 13 to means "partially or completely dissolved in a aqueous solution". The specification also state on page 10, line 2 that the instant antibody is bound to "solubilized C. *parvum* sporozoite antigen. Therefore, Perryman anticipates the instant claims because Perryman discloses that purified sporozoites solubilized in the presence of protease inhibitors were used to prepare monoclonal antibodies. Monoclonal antibodies, 7D10 and C6B6 were shown to bind sporozoite antigen. (See Example 1, page 13 and Example 2, page 17) Thus, these antibodies have been shown to be specific for a soluble antigen of C. *parvum* sporozoite.

The argument that a surface glycoprotein is not soluble is not persuasive. The specification at page 13, lines 5-16 discloses an antibody having binding specificity for a soluble C. *parvum* sporozoite antigen. The antibody is described as being specific for an antigen, such as a membrane-bound protein or glycoprotein, and as being specific for C. *parvum* and exhibits minimal or no cross reactive binding to other *Cryptosporidium* species. Therefore, the antibodies disclosed by Perryman meet these limitations. Absent evidence to the contrary, the membrane bound protein or glycoprotein discussed by the instant specification is seen to be the same as those disclosed by Perryman and any antibody binding thereto must be the same.

Applicant argues that the specification does not define "soluble" as being inclusive of glycoproteins but that "glycoprotein" is one embodiment described in the specification, and is not intended as a limiting definition. Applicant further argues that this embodiment was not incorporated into the claims, and therefore the claims cannot be interpreted as encompassing glycoproteins.

This argument is not persuasive. The specification specifically states that the antibody is a monoclonal or polyclonal antibody having binding specificity for a soluble C. *parvum* sporozoite antigen. And that a preferred embodiment is an antibody that is specific for an antigen such as a membrane bound protein or glycoprotein. This passage is broadly interpreted to mean that the disclosed antibody can bind to a soluble antigen, i.e. any antigen from sporozoite that is partially or completely dissolved in an aqueous solution, preferably, the antigen is a glycoprotein or membrane-bound protein. Nowhere in the specification nor in the Perryman reference is there a discussion of the glycoprotein or membrane-bound protein NOT being partially or completely dissolved in an aqueous solution. Since claims are not read in a vacuum, and limitations therein are to be interpreted in light of the specification in giving them their broadest reasonable interpretation, it would be reasonable to say that the claimed antibody can, preferably bind to a surface glycoprotein, making it the same with those taught by Perryman.

Applicant argues that the antigen of Perryman is the same 23 KD antigen discussed by Moss and Bonafonte, and that these two references teach that this antigen

is not specific to C. *parvum* sporozoite because it is found in both sporozoites and merozoites.

This argument is not persuasive. There is no clear evidence that the antigen, to which the antibody binds, taught by Perryman, and the antigens taught by Moss and Bonafonte are the same. Thus the argument that this antigen is not specific to sporozoite is not persuasive.

Applicant argues that because Perryman teaches the biological disruption and release of sporozoite, Perryman cannot anticipate the instant claim 17 where mechanical disruption is taught.

This argument is not persuasive because claim 17 is depended on claim 1 which is directed toward a composition comprising an antibody specific for a soluble antigen of C. *parvum* sporozoite. Therefore, in a product-by-process claim, even though the claim is limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.

Applicant argues that the antibodies taught by Petersen are not specific for soluble antigen of C. *parvum* sporozoite because Mab 10C6 and Mab 7B3 also reacts with merozoites and oocysts antigens. This argument is not persuasive because Mab E6

binds specifically to a 900,000-M_r protein (gp900) that is shown to be a sporozoites intracellular antigen.

Applicant argues that gp900 is a glycoprotein that has been shown on Bonnin to be an abundant glycoprotein of C. *parvum* merozoites and sporozoites and thus, cannot be specific to sporozoites.

This argument is not persuasive. As discussed above, the interpretation of an antibody "specific for" a certain antigen does not exclude a composition comprising an antibody that has a cross reactivity with other antigens tested, i.e. antigens from oocysts or merozoites or insoluble antigens from oocysts, merozoites or sporozoites. So long as the antibody has a higher affinity for the homologous ligand (i.e. soluble antigen of C. parvum sporozoite) than for any cross-reactive ligand tested, i.e. it discriminates very well between this ligand the others. Or, so long as only a small proportion of the antibody composition react with any single cross-reactive antigen. As such, even though Petersen has shown that some of the antibodies cross reacts with merozoites antigens, Petersen is silent with respect to the cross-reactivity of the monoclonal antibody designated E6. Thus, it is concluded that the antibody E6 recognizes an epitope that is unique to gp900 found in sporozoites. Absent evidence to the contrary, the antibody taught by Petersen is seen to the same as the instant claim.

Applicant argues that because Petersen teaches the biological disruption and release of sporozoite, Pettersen cannot anticipate the instant claim 17 where mechanical disruption is taught.

This argument is not persuasive because claim 17 is depended on claim 1 which is directed toward a composition comprising an antibody specific for a soluble antigen of C. *parvum* sporozoite. Therefore, in a product-by-process claim, even though the claim is limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.

With respect to the Riggs reference, applicant argues that the claims exclude a possibility where some of the antibodies in the composition have cross-reactivity with oocysts walls. Applicant also argues that because Riggs discloses five Mabs that binds to sporozoites antigens but also teaches that these Mabs binds to oocysts wall, therefore, these antibodies are not specific for soluble antigens of sporozoites.

This argument is not persuasive. As discussed above the claims do not exclude a composition comprising an antibody that has a cross reactivity with other antigen tested, i.e. antigens from oocysts or merozoites or insoluble antigens from oocysts, merozoites or sporozoites. So long as the antibody has a higher affinity for the homologous ligand (i.e. soluble antigen of C. parvum sporozoite) than for any cross-reactive ligand tested, i.e. it discriminates very well between this ligand the others. Or, so long as only a small proportion of the antibody composition react with any single cross-reactive antigen. Since Riggs discloses that 112 hybridomas were found to

positively bind to sporozoite as antigenic targets, and 5 were found to also bind to oocysts wall, this represents a small proportion of the antibody composition that react with a cross-reactive antigen, therefore, the composition is considered to have specificity for the target antigen, i.e. sporozoite.

Applicant argues that because Riggs teaches the biological disruption and release of sporozoite, Riggs cannot anticipate the instant claim 17 where mechanical disruption is taught.

This argument is not persuasive because claim 17 is depended on claim 1 which is directed toward a composition comprising an antibody specific for a soluble antigen of C. *parvum* sporozoite. Therefore, in a product-by-process claim, even though the claim is limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.

Allowable Subject Matter

11. Claim 5 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

12. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record fails to disclose the monoclonal antibody having ATCC designation CRL-12604.

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bao-Thuy L. Nguyen whose telephone number is (571) 272-0824. The examiner can normally be reached on Tuesday and Thursday from 8:00 a.m. -3:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long V. Le can be reached on (571) 272-0823. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

BAO-THUY L. NGUYEN
PRIMARY EXAMINER
3/5/05